



wDAQ: Ethics and Professional Responsibility

TEAM 19: LISA, ADAM, HENRY, VAUGHN

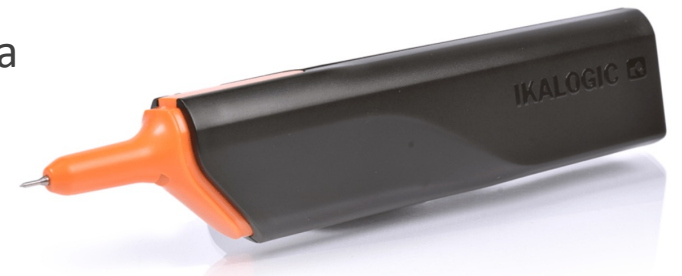
CLIENT: AVISHEK DAS

FACULTY ADVISOR: PROF. MANOJIT PRAMANIK

Project Overview

Project: Wireless Data Acquisition (wDAQ) system to capture/transmit high-frequency analog signals to a device in real time using Wi-Fi technology

- The DAQ will amplify a 1 mV analog input signal to approximately 1-2 V before digitizing it
 - ADC will have a 12-bit resolution
- Wi-Fi will be used to wirelessly transmit signals to a computer
 - Bluetooth can be used for signal transmission, but has a significantly lower data transfer rate than Wi-Fi
- The DAQ will be fabricated on a small PCB with surface-mount components
- A graphical user interface (GUI), written in LabVIEW, will be used to analyze data



Positive IDEALS Responsibility Area

- **Communication honesty:** This IDEALS responsibility is an area that our group has tended to excel in.
 - Importance: This project requires the work to be done in a truthful and diligent manner because its uses are in the field of biology. More importantly, it resides in a sector of medicine that looks at the detection of cancer.
 - Approach: Our team has enacted an approach style like our project management style, agile. We meet weekly with our client and biweekly with our advisor to communicate work, advancements, and areas of concern. Our communication comes in the form of presentations, write-ups, and demonstrations. With this vocalization of work, it has allowed the advisor and client the ability give advice on subjects that might reside outside our expertise.
 - Ethics: This approach has allowed our team to maintain to ethical standards like performing services that reside inside our expertise/competence. With that, the thorough communication strategies promoted by our agile approach have allowed us to remain non-deceptive in our work.

Negative IDEALS Responsibility Area

Financial Responsibility & Sustainability

- Our team has not been particularly conscious of spending and environmental impacts of our work
- Financial responsibility is important because it is important for us to deliver a quality product at a competitive price compared to similar devices on the market
- Sustainability is important to our project because it is always important to be aware of the environmental consequences of implementing a design, regardless of the scope
- Our team has generally agreed that we want to minimize costs throughout our project and reduce waste throughout design iterations, but we have not implemented firm tracking or control procedures
- As we continue, our team can strive to uphold ethical and professional standards by itemizing and tracking all our expenditures, forecasting projected costs, accounting for unexpected expenses that come up as we work, and striving to use nearly all materials we order or acquire for the design
 - So far, we have spent hundreds of dollars on circuit components and design parts (charged to ETG) and have wasted, disposed of, or otherwise not used many of these components
 - Ordering excess quantities of parts or products we do not need contributes to environmental waste and poor sustainability

Uncertainty & Ethical Concerns

IEEE Code of Ethics Section 7.8.I.5: "To credit properly the work of others"

- In our design, we have and continue to reference others' work, which may put us in an ethical dilemma if we do not properly credit their work.

IEEE Code of Ethics Section 7.8.I.6: "to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations"

- Given the nature of senior design, it can be a struggle balancing new tasks that challenge us to learn and undertaking tasks that completely fall outside our expertise

IEEE Code of Ethics Section 7.8.III: "To strive to ensure this code is upheld by colleagues"

- We haven't put a particular emphasis on holding others to standards of integrity, honesty, and otherwise compliance with the IEEE Code of Ethics (nor the NSPE/ACM Codes of Ethics)

References

- [1] IEEE. "Corporate Governance - IEEE." IEEE,
www.ieee.org/about/corporate/governance/p7-8.html.